

Module 1: Chromatography

Grade 5



In this module, students investigate the question, “What variables affect smears?” in order to learn about physical properties of substances. For their initial observation, students are shown an experiment in which a black dot is placed on a piece of paper, the paper is placed in a test tube of water, and as time passes the water rises and the black dot smears up the paper and separates into different colors showing students that black ink is a mixture made up of several different colors of ink and the mixture

can be separated. Students further learn about smears by planning and carrying out experiments in groups of ~3. Students in this module are able to design two experiments, the first changing up to three variables and the second changing one variable. The variables that students can explore include but are not limited to: pen color, pen type, liquid type, liquid amount, paper type, dot height, dot size, and time. At the end of the investigation groups give a poster presentation to the rest of the class, which allows the group to teach the class about the variable they investigated. In addition, on the final day of the module students learn about how to identify physical properties of substances and how these physical properties can be utilized to separate mixtures. The scientific practice this module focuses on is conclusions including identifying statements as claim, data, or neither as well as identifying appropriate claims and data based on given results. Students are given the option to change multiple variables on their first experiment and then are required to analyze their data to help them learn that when there are multiple changing variables that no claim or conclusion can be made from the data. In this module the Next Generation Science Standard performance expectation 5-PS1-3 is covered.